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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/781,363

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Steven Holdcroft

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EXAMINER

CANTELMO, GREGG

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

12/17/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/781,363	Applicant(s) HOLDCROFT ET AL.	
	Examiner Gregg Cantelmo	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-28,36-39 and 41 is/are pending in the application.
- 4a) Of the above claim(s) 14-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-13,36-39 and 41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/9/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Applicant's submission filed on October 9, 2008 has been entered.

Response to Amendment

2. In response to the amendment received September 9, 2008, entered as per the RCE filed October 9, 2008:

- a. Claims 1-4, 6-13, 14-28, 36-39 and 41 are pending with claims 14-28 withdrawn from consideration;
- b. The prior art rejections of record are withdrawn in light of the amendment. However a new grounds of rejection, necessitated by amendment is presented herein.

Information Disclosure Statement

3. The information disclosure statement filed October 9, 2008 has been placed in the application file and the information referred to therein has been considered as to the merits. Regarding U.S. Patent No. 7,029,466 (Altman), U.S. Patent No. 6,945,998 (Liotta), U.S. Patent No. 6,191,111 (Lechinsky) and U.S. Patent No. 5,425,885 (Zhao) these references have not been considered since they do not appear to be materially relevant to the claimed invention and there is

Art Unit: 1795

no statement of relevancy for these references. Clarification is respectfully requested.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 3, 4, 6-13, 35-38 and 40 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Kiefer, of record, in view of either U.S. Patent No. 5,741,611 (Fleischer) or U.S. Patent No. 6,864,010 (McLean).

Kiefer discloses a polymer electrolyte comprising a protonic polymer comprising acid groups, a vinyl phosphonic acid monomer and a cross-linking agent which includes a multiplicity of materials having at least two functionalities (abstract, examples and paragraph 139).

While the amounts of the constituents above are not clearly disclosed, pending a translation of this reference, it is noted that the claims are drawn to a product-by-process and that the end product of Kiefer and that of the instant claims which are identical in compositional elements will either inherently result in the same claimed product, else any differences would have been obvious to one of ordinary skill in the art to control the degree of crosslinking and ionic conductivity of the resultant electrolyte membrane.

“[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product

Art Unit: 1795

of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

“The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature” than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113 (as applied to claims 1 and 13). The electrodes are disposed on opposite sides of the electrolyte of EP '365 and one of ordinary skill in the art would have readily found it obvious to have the electrodes contact the electrolyte so that the electrochemical components of the electrochemical cells would be able to function as a fuel cell (as applied to claim 1).

The protonic polymer comprises acid groups (paragraph 99 as applied to claim 3).

The vinyl monomer includes phosphonic acid (abstract as applied to claims 3 and 4).

Art Unit: 1795

The cross-linking agent includes various functionalities including carboxylic acids, carboxylates, acrylates, methacrylates, etc. and includes trivinyl compositions as well (para. 139 as applied to claims 6-10).

As discussed above, the combination suggests using vinyl monomer constituents in the mixture. The claimed elasticizing compound is a vinyl monomer.

Since the teachings of Kiefer suggests using vinyl monomers in the mixture and since these vinyl monomers are generically the same as the claimed and unspecified vinyl monomer of claims 11 and 12, there is a reasonable expectation that the combination above already having a vinyl monomer present in the mixture will function as the claimed elasticizing element absent clear evidence to the contrary.

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

“In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination

Art Unit: 1795

that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

In the case of the instant application the basis for expectation of inherency is that Kiefer already employs a vinyl monomer and said vinyl monomer being the same as the generically claimed and generically disclosed vinyl monomer will provide some degree of elasticity and strength as recited in claims 11 and 12.

The Examiner invites applicant to provide that that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

Whether the rejection is based on inherency’ under 35 U.S.C. 102, on prima facie obviousness’ under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted].” The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

By example the polymer comprising PBI/phosphoric acid (para 214 as applied to claim 35). The nature of the protonic polymer conductor claim 35 being a membrane is not particularly germane to the claimed invention since the protonic polymer conductor is dissolved in the process of the product-by-process of claim 1. The composition of the protonic polymer of Kiefer is the same and the resultant final electrolyte composition in the prior art is held to be identical the composition of the electrolyte of claims 1 and 35.

Art Unit: 1795

The solvent can comprise water (paragraph 128 as applied to claims 36 and 37) or can be other polar solvents such as DMA (paragraph 214 as applied to claims 38 and 39).

Kiefer does not teach of disposing the electrolyte in channels of the cell.

In its broadest sense, it is well known to dispose a planar electrolyte between two opposing electrodes such as that shown in Fig. 1 of Fleisher or more particularly throughout the figures and disclosure of McLean. Therein the two opposing planar electrodes define a channel wherein the electrolyte layer is within the gap or channel between the two electrodes. One of ordinary skill in the art would have found it obvious to modify the teachings of Kiefer with that of Fleisher since it would have provide an well-known electrode, electrolyte, electrode configuration with the electrolyte filling the gap, space or channel between opposing electrodes thereby providing the requisite ion conducting region between the two electrodes.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Kiefer by reconfiguring the fuel cell structure to that disclosed by Fleisher or McLean which would include electrolyte channels as shown in Fig. 2 of Fleisher since it would have provided an and electrolyte membrane having increased resistance to swelling.

Regarding claim 41:

As best as claim 41 is described in light of the specification, the difference not yet discussed is of ionically bonding the electrolyte to the electrodes.

Art Unit: 1795

The use of both mechanical and chemical bonding of fuel cell elements is readily understood by one of ordinary skill in the art.

Given that the electrolyte material of Kiefer is the same and that the electrode and catalyst materials are generically identical and in the absence of a clearer definition of the nature and extent of the ionic bonding of claim 41, there is a reasonable expectation that generation of ion species of each of these layers will at least temporarily form ionic bonds between oppositely charged species in each layer.

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

“In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

Art Unit: 1795

In the case of the instant application the basis for expectation of inherency is the electrolyte material of Kiefer is the same and that the electrode and catalyst materials are generically identical and in the absence of a clearer definition of the nature and extent of the ionic bonding of claim 41, there is a reasonable expectation that generation of ion species of each of these layers will at least temporarily form ionic bonds between oppositely charged species in each layer.

The Examiner requires applicant to provide that that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Response to Arguments

5. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Upon further consideration, the amended claim language is not held to clearly distinguish the claimed invention over that which is known in the art as shown by Fleisher.

In a typical fuel cell configuration and electrolyte is disposed between opposing electrodes and thus fill a region or channel between the opposing electrodes.

Thus the structure recited the amended claims, while sufficient to overcome the previous teachings of EP '365 is not sufficient to overcome well known electrode, electrolyte, electrode configurations wherein the electrolyte is between the two electrodes and thus defines the space, gap or channel between the two electrodes. Hence the claims are still not considered as.

Claim Rejections - 35 USC § 103

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kiefer or in view of Fleisher or McLean as applied to claim 1 above, and further in view of U.S. Patent No. 5,425,687 (Singleton).

The difference between claim 2 and Kiefer is that Kiefer does not clearly require the presence of an initiator.

Singleton is drawn to cross-linking of various ion exchange membranes wherein the mixture includes a cross-linker such as divinyl benzene (col. 5, ll. 35-40). The mixture further can include an initiator (paragraph bridging columns 5 and 6).

The motivation for using an initiator would have been readily apparent to the ordinary worker in the art so as to initiate the cross-linking.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Kiefer by using an initiator since it would have provided the predictable result of initiating

Art Unit: 1795

cross-linking. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07. In addition the presence of the initiator is requisite in the process and is not clearly a component in the claimed product recited in the product-by-process claims. Thus absent clear evidence to the contrary, the initiator is not necessarily held to further limit the end product since it only serves to initiate polymerization and is not shown to materially impact the claimed composition.

7. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kiefer in view of Fleisher or McLean as applied to claim 38 above, and further in view of U.S. Patent No. 5,902,876 (Murata).

The difference not yet discussed is of the solvent comprising N,N DMA (claim 39).

Kiefer and use a polar solvent to dissolve the constituents of the electrolyte.

Kiefer teaches of using PBI which is dissolved in DMA (para 214). It is further known to dissolve PBI in N,N-DMA as taught by Murata(col. 2, ~ll.15-25).

The motivation for using N,N-DMA is that it improves the life of the polymer.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Kiefer by selecting the DMA to be N,N-DMA since it would have provided the predictable result of

Art Unit: 1795

improving the life of the polymer. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

Response to Arguments

8. Applicant makes no further arguments to the rejection of claims 2 or 39 apart from those arguments presented above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1795

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregg Cantelmo/
Primary Examiner, Art Unit 1795*